

You may read this and that book, but on no account are you to waste any time on any others; you may consult such and such original researches, but the remainder are useless. We have no doubt that this body would notify in the present instance that the student of wireless telegraphy must confine his attention to the books by Hertz and Dr. Fleming. We are not speaking of the student of electromagnetic waves. In Dr. Fleming's book is to be found a treatment of the subject which is exhaustive and thorough both on the theoretical and practical sides. It is a book which has been long wanted, and will be warmly welcomed.

One may notice, however, by a careful study of the book that wireless telegraphy practice is still to a certain extent tentative. The *best* methods are not yet decided upon, and methods differ because there is still much ignorance. But there are signs that the approach to more exact results is being made with the advent of apparatus based on wider knowledge and capable of allowing accurate measurements. Just as telegraphy needed the development of very special apparatus before full advantage could be taken of its powers, so wireless telegraphy calls for its own special apparatus. The process of development is necessarily slow, but in our present state of technical attainments it is sure.

It is quite evident from the perusal of the books before us that there is room in our complex civilisation both for ordinary telegraphy and wireless telegraphy. There are very few new discoveries which succeed in displacing old ones. We have room for many technical developments, and are capable of using all to their best advantages in the spheres for which they are particularly suited. For telegraphy over land there is little, if any, fear that wires will be displaced. There is little fear either that for communication between continent and continent the cable will give way to the overgrown "antennæ." Wireless telegraphy has found its special sphere in communication with ships, and soon will succeed in bringing us as close together at sea as we now are on land. When we consider that any man in any civilised country will be able to get into almost instant communication with any other, either on land or sea, we can realise something of the benefits conferred by telegraphy with wires and without.

MAURICE SOLOMON.

THEORETICAL BIOLOGY.

Les Problèmes de la Vie. Part iii. La Fécondation et l'Hérédité. By Prof. Ermanno Giglio-Tos, 1905. Pp. vii+189. Part ii. L'Ontogénèse et ses Problèmes. 1903. Pp. 368; 36 figures. (Chez l'Auteur à l'Université de Cagliari.)

IN the third volume of his treatise on the problems of life, Prof. Giglio-Tos proposes to elucidate all the puzzling problems of maturation, fertilisation, and heredity in the light of a fundamental phenomenon which he calls "biomolecular addition." Biologists, he tells us, have been too much preoccupied with the interpretation of particular chapters

in the history of the germ-cells, and have neglected to inquire into the fundamental cause which unifies the whole. They have reached partial interpretations, usually "artificial and teleological," of details, but a connected general theory is lacking. They have been like geologists interpreting the course of a river, and ignoring gravitation. The unifying secret is "biomolecular addition," which seems to mean the power that the living molecule (whatever that may be) has of adding to itself another molecule "so that the biomolecule resulting from the addition has double the number of atoms, and may, in consequence, divide into two biomolecules similar to one or the other of the added biomolecules." Thus a male biomolecule and a female biomolecule (identified with paternal and maternal biomolecules) may add together and then divide into two biomolecules which are either male or female. We do not profess to understand this, though the author assures us that biomolecular addition is "nothing but a chemical reaction of the greatest simplicity between the biomolecules constituting the genetic cells," and we regret that we do not understand it, for we are told that "it suffices to explain even in their minor details all the interesting manifestations accompanying the function of sexual reproduction." These are brave words, but the author's "explanation" seems to us far removed from the present-day scope of biology, in Britain at least.

The author cannot accept Weismann's theory of germinal continuity, believing, on the contrary, that the ancestors of the germ-cells become histologically differentiated, like ordinary somatic cells, along special lines of "monodic" development. At a certain epoch—"the genetic moment"—however, they come under the influence of special substances in the internal milieu, and are shunted back on a sort of return journey which brings them, or their descendants rather, to or near their starting point of resemblance to the parental ovum from which they are by cell-lineage derived. If the germ-cells can return perfectly to the state of the original fertilised ovum, with its dual equipment of male and female biomolecules, then parthenogenesis may occur. But this complete return implies very favourable nutritive conditions in the internal milieu, and, as a matter of fact, what usually occurs after the "genetic moment" is a process of internal biomolecular addition as the result of which the male or the female biomolecules in the germ-cells disappear, and two kinds of genetic cells are differentiated (with female or male biomolecules respectively). Thus fertilisation is necessary to restore the integral constitution of the original parental ovum. "The primitive cause of sexuality and of fertilisation is to be found in the phenomenon of biomolecular addition." In a laboriously ingenious fashion the author uses his key to read the mysterious ciphers of maturation and fertilisation, and he finds that it unifies everything—hermaphroditism and parthenogenesis, secondary sex characters, and the rejuvenescence of infusorians. But we have not been able to use his key, and his distinctions between pro-genetic and metagenetic parts of the body, neuter and sexual paragenetic cells, external and internal bio-

molecular additions, are not readily borne in mind. We have not been more successful with a previous volume dealing with development, which explains that there is "one fundamental principle" controlling the detailed ontogenetic phenomena, namely, "the principle of monodic development." Though it is "of extraordinary simplicity, like all the principles of natural phenomena," we have failed to detect its luminiferous quality.

But as the author emphasises the fact that if his argument is to be appreciated there must not be "the least omission of any part of the book, even if it seems a superfluous repetition," and as he "has consecrated all his intellectual activity and all his scientific passion" to working out an interpretation which seems to him "to explain the fundamental phenomena of life on absolutely scientific principles," we feel bound, in fairness, to recommend the author's painstaking work to all biologists who may have the leisure and patience which a study of "*Les Problèmes de la Vie*" requires. Perhaps another requisite which we cannot pretend to possess is a clear apprehension of the biomolecule.

J. A. T.

ECONOMIC ZOOLOGY.

Report on the Injurious Insects and Other Animals observed in the Midland Counties during 1905. By Walter E. Collinge, M.Sc. Pp. 58+xxxii figures. (Birmingham: Cornish Brothers, Ltd., 1906.) Price 2s.

MR. COLLINGE, in his third report on the injurious insects and other animals of the Midland counties, again deals with many varied subjects. The report is well illustrated, except for the figure of a weird bird and its egg supposed to represent a barn owl. Why a valuable page was wasted on such an unnatural production is impossible to understand.

One of the most interesting parts of the report is that dealing with "big-bud" in black currants, and the treatment of diseased bushes (pp. 6 and 7). In a summary Mr. Collinge tells us that he "feels convinced that the application of lime and sulphur will keep this mite in check, and if the dusting or spraying is continued will entirely eradicate it." Later he tells us that the results have been checked by many large growers, and that they clearly point to the fact that "the application of lime and sulphur offers an effective remedy." He does not tell us how many times we have to dust or spray the bushes. That "we know completely the life-history of the mite" is certainly not the fact; some dozens of points have yet to be found out.

An interesting account is also given of the plum Aphides (*Hyalopterus pruni* and *Aphis pruni*). Something is wrong, however, in the account of *Aphis pruni*, for the young coming from the winter eggs, which are very few in number, and hatch very early in the year, are not green. In early spring we find this *Aphis* as a large plum-coloured "mother-queen," and she produces green living young. The treatment recommended, namely, early spraying, is nevertheless most imperative.

NO 1917, VOL. 74]

Among other insects this useful report deals with we find notes on the pea and bean thrips, woolly aphis, currant-shoot moth, raspberry moth, cock-chafers, furniture beetles, and book-lice. There are also short accounts of the lilac *Gracilaria* and the larch *Coleophora*. The abundance of eel-worms during the past year is also dwelt upon, and a list of woodlice found in the Midlands is given.

Amongst so much of value, such as the account of the snow-fly (*Aleyrodes vaporarium*, p. 22) and the larch and spruce chermes (p. 14), that this report contains, we are sorry to see some wrong statements being carried forward. For instance, on p. 23, caustic alkali wash is *still* recommended for mussel scale in winter. Recent work has shown that it has no effect at all, even when used at treble the normal strength.

A few pages are devoted to the subject of the preservation of wild birds, illustrated by figures from the Board of Agriculture and Fisheries leaflets. There is also a short appendix dealing with the employment of hydrocyanic acid gas and bisulphide of carbon.

This report, like its predecessors, is one of much interest, but some of the remedial measures for such things as wire-worm and "big-bud" must surely not be taken too seriously by agriculturists.

FRED. V. THEOBALD.

THE FEELING FOR NATURE.

The Development of the Feeling for Nature in the Middle Ages and Modern Times. By Alfred Biese. Authorised Translation. Pp. vi+376. (London: Routledge and Sons, Ltd., 1905.) Price 6s.

NATURE in her ever-constant, ever-changing phases is indispensable to man, his whole existence depends upon her, and she influences him in manifold ways in mind as well as body." Such being the relation of nature to man, as set forth in the introduction, it has been the author's endeavour to trace in this volume the development of human thought in regard to the phenomena of nature from the introduction of Christianity downwards, in the same way that was done in a previous volume for the time of the Greeks and Romans. This has been done mainly by the study of writings, both in prose and poetry, in which natural phenomena, whether connected with scenery, weather, birds, or flowers, are spoken of with admiration. That the task of writing the book was a difficult one is freely admitted by Prof. Biese, and it is scarcely to be wondered at if at the end the book strikes the reader as somewhat less attractive than he would naturally expect from the title.

The book is largely made up of quotations, and many of these quotations do not, after all, prove very much. Then, again, as we approach recent times the quantity of literature at a writer's disposal tends to become for practical purposes infinite, and in such circumstances anything might be proved by choosing suitable quotations. Again, in quoting poetry as an indication of popular feeling at various times it must not be forgotten that poetry is, from the very nature of things, essentially conservative, so